We claim:

1. A switch mode power supply, comprising:

a switching transistor having a load path formed by a first main connection and a second main connection, said first main connection and said second main connection for receiving a voltage applied thereto, said switching transistor including a semiconductor body with a semiconductor layer of a first conductance type forming a drift area;

a load connected in series with said load path of said switching transistor;

a continuous drain region of a second conductance type incorporated into said drift area and connected to said first main connection;

a continuous source region of the second conductance type incorporated into said drift area and connected to said second main connection;

a reverse-biased pn-junction produced by an interaction between said semiconductor body and said continuous drain region and between said semiconductor body and said continuous source region;

said reverse-biased pn-junction having a large inner voltage-dependent surface area that is variable as a function of the voltage applied to said first main connection and said second main connection;

when the voltage applied is 10 V, said switching transistor is characterized by a first product of a switch-on resistance R_{on} and a gate charge Q_{gtot}, the first product given by:

$R_{on} * Q_{gtot}/10\ V \leq 2.5$ ns; and

when the voltage applied is 400 V, said switching transistor is characterized by a second product of the switch-on resistance R_{on} and energy E_{ds} stored in a drain-source capacitance, the second product given by $R_{on} * E_{ds} \leq 1.6\ V^2\mu s$.

2. The switch mode power supply according to claim 1, wherein said voltage-dependent surface area of said pn-junction is reduced as the voltage applied is increased.

3. The switch mode power supply according to claim 2, wherein an amount of charge in said switching transistor, which is calculated via a line integral along a line at right angles to said pn-junction, remains below a material-specific breakdown charge.

4. The switching transistor according to claim 3, wherein said continuous drain region of said second conductance type and said continuous source region of said second conductance type are configured in a structure selected from the group consisting of a vertical structure and a lateral structure.

5. The switch mode power supply according to claim 1, comprising a charge storage device connected in parallel with said load path of said switching transistor.